



Illinois Environmental Protection Agency

Construction Quality Assurance Plan Source Area 4 Remedial Design Southeast Rockford Groundwater Contamination Site

September 13, 2004

Draft Final Report

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Subject SE Rockford Groundwater Contamination Area 4 Design
Plans

Today (9/14/04), I received two sets of the following pre-final (90%) remedial design documents from CDM, IL EPA's RD contractor for the above-noted source area at the SE Rockford Groundwater Contamination site. The documents consisted of general, civil, structural, mechanical, HVAC, and electrical drawings; a Performance Standards Verification Plan (which in turn has appendices containing the Quality Assurance Project Plan, the Sampling and Analysis Plan, and the Health and Safety Plan); a Construction Quality Assurance Plan; and a listing of Specifications for potential construction contractors providing 16 Divisions of work, such as concrete, masonry, metals, mechanical and electrical equipment, instrumentation, etc.

The plans were accompanied by a letter report which described how and in what areas of the plans the RD contractor was addressing IL EPA and U.S. EPA comments previously relayed on the 60% (Intermediate) set of plans. On reviewing the responses provided by the RD contractor, it would appear that all agency comments were satisfactorily addressed.

Russell Hart

Illinois Environmental Protection Agency

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Section
One

Section 1

Introduction

The Construction Quality Assurance Plan (CQAP) describes the methods and procedures of the quality assurance/quality control (QA/QC) program that will ensure that the completed project meets or exceeds all design criteria from the plans and specifications. This Draft Final CQAP will be submitted as part of the "Pre-Final" package to the Illinois Environmental Protection Agency (Illinois EPA), as specified in the Southeast Rockford Groundwater Contamination Superfund Site, Source Area 4, Remedial Design Work Plan, prepared by Camp Dresser & McKee (CDM). Also to be submitted as part of the "Pre-Final" will be the Draft Final Quality Assurance Project Plan and Sampling and Analysis Plan (QAPP/SAP) which describe the methods, procedures and QA/QC for all analytical testing to be performed as required by the plans and specifications.

The Draft Final CQAP has been developed following incorporation of Illinois EPA and USEPA comments on the "Intermediate" design. The Final CQAP will be submitted prior to the start of construction by the remediation contractor selected and contracted by Illinois EPA. The CQAP will be prepared in accordance with all applicable Area 4 design documents and specifications, and the U.S. Environmental Protection Agency "Remedial Design/Remedial Action Handbook" (document 9355.0-04B, PB95-963307, EPA 540/R-95-059, June 1995).

Components of the CQAP include: 1) responsibility and authority, 2) QA personnel qualifications, 3) inspection and certification of the work, 4) sampling requirements for construction-related items, 5) field performance and testing requirements, and 6) documentation.

Quality assurance (QA) is the planned or systematic actions that are implemented to ensure that construction work is completed in accordance with design requirements and applicable standards for materials, equipment, and workmanship. Quality assurance includes: 1) establishment of a construction quality control (QC) program and 2) implementation and ongoing evaluation of the program by performing inspections, verifications, and audits, using established means to control and measure the quality of products and workmanship. Quality control also includes the implementation of corrective measures, when necessary, to ensure proper completion of work.

The Record of Decision (ROD) for the Southeast Rockford Superfund site was signed by the Region V Administrator of the United States Environmental Protection Agency (U.S. EPA), on June 11, 2002. Under contract to the Illinois EPA, The Contractor shall follow the ROD, the approved Statement of Work (SOW), and the approved Remedial Design (RD) for remedial action at Area 4 for the site.

Illinois EPA's Representative is responsible for observing and documenting activities related to all field work and quality assurance of all activities of the work. Illinois

EPA's Representative is responsible for the implementation of this CQAP for the remedial action at Area 4

1.1 Project Description

In 1981, the City of Rockford discovered groundwater contamination at the property that became the Southeast Rockford Superfund site. In 1981 to 1997, the Illinois EPA and the Illinois Department of Public Health (IDPH) performed investigations at the site that revealed that volatile organic compound (VOC) contaminants were present in the groundwater, soil, and soil gas. During this and other investigations, the following contaminants of concern have been identified: 1,1-dichloroethene (1,1-DCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-trichloroethane (1,1,2-TCA), trichloroethene (TCE), tetrachloroethene (PCE), and carbon tetrachloride (carbon tet).

Chlorinated solvents are the principle contaminants present at the site. Contaminants were released to the environment from storage tanks or improper disposal practices. Soil contamination, including visible staining and free product, exists from approximately 25 to 37 feet below ground surface (bgs) in the east and west portion of the excavation area, and from just below the surface to 37 feet bgs in the central portion of the excavation where waste was thought to have been placed on the ground. Groundwater samples collected from the aquifer in the overburden soil revealed that chlorinated solvent contamination was present in the groundwater. Groundwater is encountered at approximately 30 feet bgs.

Southeast Rockford Superfund Site is comprised of three operable units (OU). Operable units are delineated by drinking water, groundwater, and source control constituents. The three operable units are as follows:

- Operable Unit 1 (OU1): Drinking Water Operable Unit
- Operable Unit 2 (OU2): Groundwater Operable Unit
- Operable Unit 3 (OU3): Source Control Operable Unit

Operable Unit 3 is the subject of the remedial design. Operable Unit 3 includes four contaminant source areas, Areas 4, 7, 9/10, and 11. The four areas are designated as Source Control Operable Units (SCOU). Area 4 is the focus of study for this CQAP.

Area 4 consists of a building and a parking lot that formerly housed a Swebco Manufacturing, Inc. machine shop. Presently, the building is used as a wood pallet manufacturing and refurbishing operation.

1.2 Project Summary

Remedial action will be implemented at the site in Area 4 to remove the source of chlorinated solvent contamination. Remedial action will consist of soil excavation, treatment of contaminated soil, and leachate containment and treatment of the affected area (Area 4), to address the soil and groundwater contamination.

Contaminated soil will be excavated and treated by low temperature thermal desorption (LTTD) then returned as backfill to the soil excavation. Uncontaminated overburden, where it exists, will be stockpiled and returned to the excavation. Dewatering of the soil excavation will occur during excavation activities. Temporary wells will be installed in the vicinity of soil excavation for dewatering. Contaminated groundwater from dewatering will be pumped to an onsite air stripper unit for treatment and subsequently, effluent water will be discharged to the concrete-lined drainage ditch immediately north of the site.

Following completion of the soil excavation and LTTD treatment activities, monitoring wells will be installed in the vicinity of the soil excavation to obtain groundwater samples for laboratory analysis to monitor contaminants in the groundwater following remedial action.

Finally, extraction wells will be installed downgradient of the excavation for long-term hydraulic containment of leachate. Extracted leachate will be pumped to an onsite air stripper unit for treatment and subsequently, effluent water will be discharged to the concrete-lined drainage ditch immediately north of the site.

1.3 Remedial Action Objectives

Remedial Action Objectives (RAOs) provide a general description of what the proposed alternative will accomplish. The following RAOs apply to Area 4, as well as the other three source areas:

- Prevent the public from ingestion of soil, and direct contact with soil containing contamination in excess of state or federal standards or that poses a threat to human health
- Prevent the public from inhalation of airborne contaminants in excess of state or federal standards or that pose a threat to human health
- Prevent the further migration of contamination from the source area that would result in degradation of site-wide groundwater or surface water to levels in excess of state or federal standards, or that pose a threat to human health or the environment¹.

Soil and water samples will be collected for laboratory analysis, to determine if contaminants are present in the media. Analytical data of soil and groundwater samples will be compared to the remediation goals specified in the ROD, and subsequently established remediation goals.

¹It should be noted that contaminant migration from the source areas has already resulted in site-wide groundwater contamination in excess of state standards. The RAO is intended to remediate each source area in order to prevent *further* migration of contaminants from the source area.

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Section Two

Section 2

Definitions, Qualifications, and Responsibilities

Definitions, qualifications and responsibilities of parties discussed in this section are outlined based on the distinctive nature of the party described. These roles may be filled by Contractor personnel or subcontractor, depending on the qualifications necessary.

2.1 Contractor

2.1.1 Definition

The Contractor is the firm(s) or corporation(s) with which Illinois EPA has entered into agreement to conduct the remedial action.

2.1.2 Responsibilities

The Contractor is responsible for all submittals required by the specifications as discussed in Section 01300 of the specifications. These include submittals applicable to the final CQAP, Remedial Action Schedule, Health and Safety Plan, Emergency Response Plan, training certifications, sampling and analysis data, subcontractor, vendor and disposal facilities information, shop drawings (if necessary) and all other submittals required by the technical specifications. The Contractor is also responsible for revising or adding to the existing planning documents (specifically the Quality Assurance Project Plan Addendum, the Sampling and Analysis Plan Addendum and Community Relations Plan) as described in each of these documents. The Contractor is responsible for all scheduling and coordination of the required Work with transporters, disposal facilities, laboratories, local authorities, subcontractors (where applicable), Illinois EPA, Illinois EPA's Representative and any other parties performing services during the Work.

The Contractor shall provide a representative at all times during any Work onsite to manage daily activities. The Contractor shall also provide a quality assurance officer to monitor quality assurance/quality control measures throughout the duration of the Work. The Contractor is responsible for updating all design drawings (if applicable) onsite daily for all deviations from the Contract Drawings. All deviations must be initialed and approved daily by Illinois EPA's Representative.

2.1.3 Qualifications

The Contractor shall be qualified to perform all aspects of Work required to successfully complete the Work as Contracted. The Contractor and any secured subcontractors shall be registered in the state where the project is located for all Work to be performed and shall demonstrate prior related experience as required in the specifications.

2.2 Contractor's Representative

2.2.1 Definition

The Contractor's Representative is a qualified individual assigned by the Contractor to represent him/her onsite at all times during all Work activities.

2.2.2 Responsibilities

The Contractor's Representative is responsible for coordinating and supervising his/her crew and subcontractors' work onsite. The Construction Representative is responsible for making sure that the Work activities are conducted in accordance with the plans and specifications. The Contractor's Representative is responsible for notifying Illinois EPA's Representative of any discrepancies between the plans and specifications and the field conditions. The Contractor's Representative is responsible for keeping a daily log of all Work activities onsite. The Contractor's Representative is responsible for proposing alternative methods, where necessary, to Illinois EPA's Representative for approval and signature, as required by the specifications.

2.2.3 Qualifications

The Contractor's Representative shall be a qualified individual who is experienced with all the tasks associated with the Work. The Contractor's Representative shall demonstrate prior and similar experience to Illinois EPA's Representative. The Contractor's Representative shall have authority to direct and instruct his/her crew and his/her subcontractors.

2.3 Contractor's Quality Assurance Officer

2.3.1 Definition

The Contractor's Quality Assurance (QA) Officer is a qualified individual assigned by the Contractor to monitor quality assurance/quality control (QA/QC) means and measures for the duration of the Work.

2.3.2 Responsibilities

The Contractor's QA Officer is responsible for making sure that all Work is conducted in accordance with this CQAP and the QAPP/SAP and all QA/QC measures detailed in the specifications. The Contractor's QA Officer is responsible for making sure that all daily, activity or incident QA/QC reports, as detailed in the specifications, are submitted to Illinois EPA's Representative in a timely manner. The Contractor's QA Officer is responsible for proposing alternate QA/QC methods, where necessary, to Illinois EPA's Representative for approval and signature, as required by the specifications. The Contractor's QA Officer shall be accessible for communication with either the Contractor's or Illinois EPA's Representative for the duration of the Work.

2.3.3 Qualifications

The Contractor's QA Officer shall be a qualified individual who is experienced with all the tasks associated with the QA/QC procedures during the Work. The Contractor's QA Officer shall demonstrate prior and similar experience to Illinois EPA's Representative. The Contractor's QA Officer shall have the authority to direct and instruct his/her crew and subcontractors on all QA/QC procedures.

2.4 Engineer

2.4.1 Definition

The Engineer is the individual and/or firm responsible for the preparation of the design, including plans and specifications for the remedial action.

2.4.2 Responsibilities

The Engineer is responsible for performing the engineering design and preparing the associated drawings and specifications for the remedial action.

2.4.3 Qualifications

The Engineer shall be qualified, certified or licensed, as required by the Illinois Department of Professional Regulation. The Engineer shall be familiar with remedial actions at Superfund sites, and all applicable regulatory requirements.

2.5 Illinois EPA's Representative

2.5.1 Definition

Illinois EPA's Representative is a firm/individual independent from the Contractor that will be responsible for observing and documenting activities related to the quality assurance of the Work on behalf of Illinois EPA. In the scope of this document, the term "Illinois EPA's Representative" applies to a qualified individual assigned by Illinois EPA to oversee all Work activities for the duration of the project.

2.5.2 Responsibilities

Illinois EPA's Representative is responsible for observing and documenting activities related to all field activities and quality assurance of all activities of the Work. Illinois EPA's Representative is responsible for implementation of this CQAP and coordination with the Contractor's QA Officer. Illinois EPA's Representative shall attend the preconstruction conference, coordination and progress meetings outlined in this CQAP and specification Section 01200.

The specific duties of Illinois EPA's Representative personnel include, but are not limited to the following:

- a. Approves all design and specification changes and makes design clarifications necessitated during Work activities.

- b. Reviews and approves shop drawings submitted by the Contractor. Approved drawings shall be submitted to the permitting agency for final approval, as necessary.
- c. Reviews other site-specific documentation, including proposed layouts and Manufacturer's and installers' literature, where applicable.
- d. Attends all project and quality assurance related meetings (preconstruction conference, coordination and progress meetings) as described in specification Section 01200.
- e. Provides review of Contractor's Work procedures and submittals as necessary. Illinois EPA's Representative shall return the Contractor's submittals within 30 working days following receipt.
- f. Calls for cease of operations under the necessary conditions of imminent hazard.
- g. Collects performance verification samples from treated soil, and coordinates laboratory analysis.
- h. Coordinates vehicle inspection and record of any waste quantities leaving the site for disposal with the Contractor's Representative. These quantities shall be verified with the quantities recorded at the disposal facilities. Retains copies of all waste disposal manifests, Contractor submittals and all other information required to be provided to Illinois EPA's Representative by the Contractor.
- i. Reviews Contractor's Health and Safety Plan and Emergency Response Plan for content, including equipment, vehicle and personnel decontamination procedures. This review does not in any way constitute approval or responsibility for Contractor's staff adherence to these plans.
- j. Works in cooperation with the Contractor's Site Safety and Health Officer to investigate and document any incident (emergency situation or imminent hazard as covered by the Contractor's Emergency Response Plan and discussed in Section 01101 of the specifications). Both parties will work to resolve appropriate steps to be taken in response to the incident, in accordance with the Contractor's Emergency Response Plan.
- k. Acts as the onsite (resident) representative of Illinois EPA.
- l. Reviews all Manufacturer, Installer or subcontractor certifications and documentation and makes appropriate recommendations.
- m. Reviews all Manufacturer, Installer or subcontractor personnel qualifications for conformance with those qualifications pre-approved for Work onsite.

- n. Reviews the calibration certification of all onsite monitoring equipment.
- o. Reviews all daily reports, logs and photographs, as applicable.
- p. Notes any onsite activities that could result in later complications or unanticipated damage to site, and discusses any of these issues with the Contractor's Representative as necessary.
- q. Reports to Illinois EPA and logs in the daily report any relevant observations.
- r. Prepares his/her own daily report and weekly summary for documentation purposes.
- s. Oversees the marking, packaging, and shipping of all laboratory test samples.
- t. Reports any unapproved deviations from the CQAP to Illinois EPA.
- u. Monitors, logs, photographs daily Work activities. Photographs shall be taken routinely and at critical times during the excavation and treatment process.
- v. Collects duplicate samples of Contractor's sampling for confirmation analyses as deemed necessary.
- w. Oversees compaction testing as specified in Section 02200.
- x. Any other duties described in the specifications.

2.5.3 Qualifications

Illinois EPA's Representative shall be familiar and experienced in the implementation of the Work to be performed as detailed in the specifications, drawings and all other planning documents developed by the Contractor.

2.6 Site Safety and Health Officer

2.6.1 Definition

The Contractor's Site Safety and Health Officer is a qualified individual assigned by the Contractor to assist and represent the Health and Safety Professional in the continuous daily implementation and enforcement of the Contractor's HASP and development of the Emergency Response Plan for the duration of the Work (see specifications Sections 01101).

2.6.2 Responsibilities

The Site Safety and Health Officer (SSHO) shall coordinate and monitor the continuous daily implementation and enforcement of the HASP. The SSHO shall be assigned to the site on a full-time basis and shall report to the Contractor's in matters pertaining to site safety and health. The SSHO shall be responsible for preparing and maintaining Daily Safety Logs and reports; the specific contents of these Daily Safety

Logs and reports are discussed in specification Section 01101. The SSHO shall provide Illinois EPA's Representative with copies of all logs and reports on a daily basis. The SSHO shall also maintain a continuous health and safety monitoring program throughout the performance of the Work. It shall be the SSHO's responsibility to notify Illinois EPA's Representative of any deviations in the health and safety monitoring program required for the performance of the Work.

Should an unanticipated incident occur that poses an imminent or substantial hazard in the opinion of the Contractor's Site Safety and Health Officer (SSHO) or Illinois EPA's Representative, Work within the area influenced by the incident will be suspended by the Contractor until the emergency situation has been brought under control, the incident has been evaluated, and site conditions which contributed to the emergency have been mitigated.

2.6.3 Qualifications

The qualifications and pre-qualification requirements of the SSHO shall include:

- a. A minimum of 1 year working experience at hazardous materials or waste sites where Level B personal protective equipment is required.
- b. A working knowledge of Federal and State safety and health regulations.
- c. Specialized training in personal and respiratory protective equipment program implementation and in the proper use of air monitoring instruments and air sampling methods and procedures.
- d. Current certification in first aid and cardio pulmonary resuscitation (CPR) by a recognized approved organization such as the American Red Cross.
- e. In addition to 40 hour OSHA training, annual refresher training, and medical monitoring, the SSHO shall also be supervisory trained.
- f. The name, the qualifications (education summary and documentation), and the work experience of the SSHO shall be submitted to Illinois EPA's Representative for review, prior to the commencement of work at the site.

3

Section
Three

Section 3

Quality Assurance/Quality Control Program

The Quality Assurance/Quality Control (QA/QC) program for remedial action at the Southeast Rockford Superfund site will be the responsibility of the Contractor and will be overseen by Illinois EPA's Representative. The purpose of the QA/QC program is to ensure that all aspects of the remedial action are completed in accordance with specifications of the Remedial Design. The Contractor will examine materials, equipment, procedures, and workmanship to determine if remedial action activities are properly performed, using materials conforming to standards. The Contractor will document activities relating to the remedial action.

The Contractor will adhere to the QA/QC program which covers items pertaining to field activities and project management. All Contractor, subcontractor, and other personnel working on the project will be responsible for following the QA/QC program. The QA/QC program addresses preliminary activities, field activities, and management activities.

3.1 Preliminary Activities QA/QC

Prior to initiating field activities, several preliminary activities must be accomplished, for the remedial design. To assure that preliminary activities are completed, the Contractor will perform the following for QA/QC purposes:

- Review specifications and drawings in Remedial Design
- Review the Health and Safety Plan
- Verify all necessary permits were obtained from local and state agencies
- Verify notifications were submitted to local community and state agencies
- Verify licensed professionals will be used for onsite personnel and subcontractors
- Examine work area and mark soil excavation area, designated staging areas, and locations of treatment units

The Contractor will maintain onsite copies of the necessary paperwork (e.g., permits, professional licenses, etc.), and also submit a copy to the Illinois EPA Representative.

3.2 Field Activities QA/QC

The Contractor will oversee remedial action field activities for the remedial design. To assure that field activities are completed properly, the Contractor will perform the following for QA/QC purposes:

- Upon delivery onsite, inspect materials and equipment for compliance to specifications; Reject items that are not compliant
- Inspect field activities work in progress to verify procedures are completed according to specifications
- Verify field personnel don proper personal protective equipment (PPE)
- Verify monitoring activities are being performed
- Verify validity of compaction tests of backfilled soil
- Verify submersible pumps, LTDD unit, and air stripper unit are functioning properly and operational
- Verify slump testing and compressive strength testing of concrete (if applicable)
- Perform calibration of field monitoring instruments
- Verify testing of electrical grounding system for treatment systems
- Verify field tests
- Promptly notify the Illinois EPA Representative of any changes in scope, costs, schedule
- Request change order (if necessary)
- Communicate daily with Illinois EPA Representative
- Document telephone conversations
- Photograph activities

The Contractor will obtain copies of all tests performed in the field and will document all field activities in a field notebook.

3.3 Management Activities QA/QC

The Contractor will follow QA/QC procedures for management activities for the remedial design. To assure that field activities are completed properly, the Contractor will perform the following for QA/QC purposes:

- Review laboratory analytical data
- Review schedule
- Review subcontractor invoices

The Contractor will maintain copies of analytical data and subcontractor invoices onsite as well as in the project file for safekeeping.

4

Section
Four

Section 4

Section 4

Monitoring Procedures

During remedial action, the Contractor will perform field monitoring of the excavated soil and ambient air for volatile organic vapors. Monitoring will consist of visual monitoring of excavated soil and monitoring of soil and air using a photoionization detector (PID). Soil will be monitored visually and via PID during excavation procedures. Ambient air within the excavation and at the fence line, will be monitored periodically for VOCs to determine the proper level of personal protective equipment (PPE). Additionally, continuous monitoring for particulates as well as visual monitoring for dust will be conducted during all excavation and filling activities. Monitoring of ambient air during field activities will also be conducted to adhere to the Health & Safety Plan and Section 01101 of the Specifications. Soil and groundwater samples will be collected for laboratory analysis to document contaminant levels that may remain at the excavation limits and to document the groundwater conditions during and after soil removal and treatment.

4.1 Visual Monitoring

During soil excavation activities, the Contractor will periodically monitor the excavated soil. The Illinois EPA Representative will also monitor excavated soil. Excavated soil will be monitored via visual inspection and PID. The Contractor will periodically visually inspect the excavated soil for physical evidence of contamination (i.e., staining, odor). Visual monitoring will be conducted to aid in determining the final limits of soil excavation. Soil with physical evidence of contamination will be treated using LTDD in accordance with Section 13713 of the specifications. At the conclusion of soil excavation, the soil on the floor and sidewalls of the excavation will be monitored, to aid in delineating the final extent of excavation.

The Contractor shall perform visual monitoring of airborne dust during all active work times. Visual monitoring for dust shall be performed at the limits of Work downwind of the work area. Contractor shall conduct his/her operations to prevent the migration of dust from the immediate work areas and shall adjust operations as specified in Sections 01101 and 01562, if visual monitoring indicates the potential for airborne dust to migrate beyond the fence line of the property.

4.2 Air Monitoring Equipment

CDM will monitor the soil and ambient air for VOCs using a calibrated photoionization detector (PID). The PID will detect volatile organic compounds emitted from the soil and in the ambient air. The battery of the PID will be charged each night and other routine maintenance shall be performed as specified in the operating instructions.

The Contractor shall perform ambient air monitoring for the purposes of determining the effectiveness of the Contractor's dust control activities. The Contractor shall use both daily real-time air monitoring and weekly air sampling and subsequent

laboratory analysis as specified in Section 01101 of the specifications. The Contractor shall perform air monitoring at five locations along the fence line of the property and as described in the specifications. Exact locations shall be approved by IEPA's Representative.

4.2.1 Real-time Particulate Monitoring Stations

Automated particulate monitoring equipment shall have the capabilities listed below.

1. Continuous, uninterrupted operation.
2. 60-second sampling frequency.
3. Data averaging over user-selected averaging period.
4. Concentration measurement range: 0.001 to 100 mg/cubic meter
5. Precision/repeatability: + or - 10 ug/cubic meter
6. Accuracy: + or - 5 percent of reading + or - precision
7. Particle size range: 0.1 to 10 um
8. Measure ambient air concentrations of particulate matter with aerodynamic diameter less than 10 microns (PM-10). Output concentration readings in micrograms per cubic meter (ug/cubic meter).
9. Datalogger with minimum 72-hour data storage capability, and ability to download data to PC for storage and reporting. Automated data averaging over user-selected durations.
10. Housing or enclosure providing all-season operation and protection from the elements, tampering, or unauthorized access.

4.3 Air Monitoring Frequency

Ambient air emitted from the soil excavation will be checked with the PID every 15 minutes during excavation or filling activities or more frequently if a visual determination of contamination is noted.. These PID readings will be used to determine the proper level of personal protective equipment (PPE).

Visual monitoring for dust shall be conducted concurrently with the monitoring for VOCs using the PID. The continuous particulate monitoring shall be performed during all excavation and filling activities as described in Section 01101 of the specifications.

4.3.1 Soil Monitoring

During soil excavation, the excavated soil will be monitored using a PID periodically to aid in determining the final limits of the excavation. At the estimated conclusion of soil excavation, the soil on the floor and sidewalls of the excavation will be sampled and analyzed in the field using a test kit or field gas chromatograph, to aid in delineating the final extent of excavation. Soil samples will be obtained for laboratory analysis at the conclusion of excavation based on the field sampling and analysis. This sampling will be performed as per Section 01113 of the specifications and Section 7.3 of the QAPP. Four discrete samples will be collected from each side wall and the bottom of the excavation and combined to form one composite sample for each sidewall and the floor of the excavation. These samples will be placed in the appropriate sample containers and sent for laboratory analysis. This data will be used to document any remaining levels of contamination present at the limits of excavation.

4.3.2 Groundwater Monitoring

Quarterly groundwater sampling will be performed to monitor the onsite groundwater conditions. For each groundwater sampling event, groundwater samples will be obtained and submitted for laboratory analysis for VOCs. Groundwater sampling will be performed to determine if contaminants are present in the groundwater above the groundwater remediation goals as set forth in the ROD.

4.4 Field Documentation

Monitoring activities will be documented in a field notebook. Daily calibration of the PID will be described and include daily background ambient air readings. Visual monitoring of the excavated soil will be recorded and include evidence of contamination (i.e., staining, odor). All PID measurements of volatile organic content of soil and air will be written in the field notebook. PID readings of excavated soil and soil remaining in the final soil excavation will be recorded in the field notebook. PID readings of the ambient air, including air underneath the temporary enclosure of the soil excavation will be recorded in the field notebook.

The Contractor shall submit to IEPA's Representative Daily Summary Reports as described in Section 6.3.1 of this CQAP as well as any other applicable documentation as described in Section 6.0 of this CQAP. Note that the data reporting required in this section shall not relieve the Contractor of incident reporting requirements.

5

Section Five

Section 5

Construction Activity Monitoring

Illinois EPA's Representative will be responsible for providing field oversight and monitoring construction activities for the remedial action. Illinois EPA's Representative will monitor construction activities including soil excavation, construction of soil- and water-treatment units, and monitoring well installation. Illinois EPA's Representative will inspect materials used during remedial action and observe that activities are performed in adherence to proper protocol. Illinois EPA's Representative will immediately contact the Contractor when items and procedures are not in compliance with standard operation.

5.1 Soil Excavation

Soil excavation will be performed to remove the source of contamination from the subsurface soil. At the prescribed location, soil will be excavated to a depth of 37 feet below grade; therefore, sheet pile installation will be required to prevent collapse of the excavation as per Section 02161 of the specifications. Sheet pile installation is required at a depth of 5 feet below grade and below, for excavations, according to Occupational Health and Safety Administration (OSHA) requirements. Excavated soil will be treated onsite at a low temperature thermal desorbition (LTTD) treatment unit. The soil excavation will be backfilled with LTTD-treated soil with backfill compaction as described in the specifications part 02200.

Illinois EPA's Representative will perform visual inspections of soil excavation activities, may conduct split soil sampling of LTTD-treated soil for laboratory analysis, and oversee backfill compaction.

5.2 Construction of Treatment Units

The Contractor will construct a soil treatment unit and a water treatment unit onsite. Treatment units will be constructed according to specifications outlined in Sections 13713 and 13905 of the specifications. A low temperature thermal desorbition (LTTD) unit will be erected to treat contaminated soil and an air stripper unit will be erected to treat contaminated water.

Illinois EPA's Representative will perform visual inspections of treatment unit construction activities and oversee field tests to verify that units are fully operational.

5.3 Monitoring Well Installation

The Contractor will perform monitoring well installation activities in accordance with Section 02141 of the specifications. Submersible pumps will be installed in the wells to pump water to the air stripper unit. Submersible pumps and the pipework lattice connecting to the air stripper unit will conform to Section 02140 of the specifications.

Illinois EPA's Representative will perform visual inspection of monitoring well installation activities, oversee field tests to ensure that submersible pumps are

functional, and may collect split groundwater samples from the wells and air stripper unit for laboratory analysis.

5.4 Visual Inspection

The Contractor and Illinois EPA's Representative will perform visual inspections of equipment and materials used during remedial action. Equipment in disrepair will not be allowed to be used onsite. Materials must conform to the required specifications. Materials for inspection include sheet piles, soil treated by low temperature thermal desorption (LTTD), and the air stripper unit including effluent discharge.

5.5 Soil Sampling Protocol

Soil samples will be obtained for analysis, following LTTD treatment of soil as per Section 13713 of the specifications and Section 7.3 of the QAPP/SAP. The LTTD-treated soil will be placed into a stockpile and composite soil samples will be obtained. A composite sample will be collected at a rate of one per day of LTTD treatment operation. Composite samples will be collected by obtaining soil from several discrete areas of the soil stockpile and placing the soil onto new plastic sheeting. The soil will be thoroughly mixed and subsequently quartered, and the composite sample will be placed directly into laboratory containers. The analytical results will be compared to the soil remediation goals established in the ROD.

5.6 Backfill Compaction Testing Protocol

Excavated and treated soil shall be placed in layers having a maximum thickness of 6-in measured before compaction. Excavated material reused on-site shall be thoroughly compacted to at least 95 percent of maximum dry density as determined by ASTM D1557, Method D.

Previous to the general placement of the fill, and during such placement, Illinois EPA's Representative will select areas within the limits of the fill for testing the degree of compaction obtained. A minimum of one compaction test shall be performed for each 2,500 square feet of soil placed or one per lift, whichever is smaller. The Contractor shall cooperate fully in obtaining the information desired.

Testing will be made by the Contractor's independent testing firm under the direction of IEPA's Representative. If test results are unsatisfactory, all costs involved in correcting deficiencies in compacted materials and retesting to the satisfaction of the Illinois EPA's Representative, will be borne by the Contractor.

5.7 Field Documentation

During remedial action, The Contractor will document construction activities in a field notebook. For each activity, procedures and equipment will be logged in the notebook. Equipment at the site (used and idle) will be recorded in the field notebook at the onset of each day. Additionally, visual inspections of equipment and material

will be recorded and observations of treated soil and compaction activities, including compaction testing and results, will be noted.

The Contractor shall submit to Illinois EPA's Representative Daily Summary Reports as described in Section 6.3.1 of this CQAP as well as any other applicable documentation as described in Section 6.0 of this CQAP. Note that the data reporting required in this section shall not relieve the Contractor of incident reporting requirements.

6

Section
Six

Section 6

Documentation Requirements

The Contractor will adhere to documentation requirements during remedial action at the Southeast Rockford Superfund site. Documentation requirements include qualifications of firms and personnel; recording field activities and procedures in a field logbook; preparing various reports as described below and document control.

6.1 Qualifications of Firms & Personnel

Qualifications of all firms and personnel working on the project will be compiled by the Contractor and submitted to Illinois EPA's Representative. Illinois EPA's Representative will review qualifications for acceptance. Personnel shall provide copies of certifications and licenses.

6.2 Field Documentation

The Contractor will be responsible for performing field documentation for onsite remedial action activities. Field documentation shall include the following:

- Date and Event
- Weather Conditions and Changes in Weather
- Onsite Personnel, Company Affiliation, and Roles
- Time of Arrival/Departure of Onsite Personnel
- Onsite Equipment (currently in use and idle)
- Calibration of Field Monitoring Equipment
- Level of Personal Protective Equipment
- Meetings including Health & Safety meetings
- Remedial Action Activities
- Delivery of Supplies and Equipment
- Changes to plan & field conditions
- Problems and of health and safety incidents
- Field testing

6.3 Reports

This section describes documentation and record keeping activities and materials that will be used during the Area 4 remediation activities. Contractor QA forms and checklists should be developed prior to the start of the construction activities and submitted to Illinois EPA's Representative for review. The forms and checklists should be designed to assist Contractor personnel in providing documentation and records for formulation of the site-specific Certification Report.

6.3.1 Daily Summary Reports

The Contractor Quality Assurance Inspector (CQAI) will prepare daily reports. These reports will provide documentation of construction activities and quality assurance testing. They will be written and submitted in a timely manner. Inspection data sheets will be attached to the daily summary reports. As the need arises, specific problem identification and correction reports will also be prepared to address critical issues.

6.3.1.1 Inspector's Daily Report

An Inspector's Daily Report (IDR) will be prepared and filed during each day of construction by the CQAI. This report will provide the chronological framework for identifying and recording all data sheets and/or quality assurance testing. The IDRs will include the following information:

- date, project name, location and identification code;
- date and weather conditions;
- notes on meetings held and their conclusions;
- components and locations of construction underway during the time frame of the daily report;
- equipment and personnel working on each construction component, including subcontractors;
- description of areas or components being inspected and documented;
- description of offsite materials received, including any quality verification (vendor certification) documentation;
- calibrations, or recalibrations, of test equipment including actions taken as a result of recalibration;
- decisions made regarding approval of units of material or work items, and/or corrective actions to be taken in instances of substandard quality;

- unique identifying sheet numbers of inspection data sheets and/or Problem Identification and Correction Reports (PICRs) used to substantiate the decisions described in the preceding item; and
- signatures of the CQAO and CQAI.

6.3.1.2 Inspection Data Sheets

All observations and field and laboratory tests will be recorded on Inspection Data Sheets.

The following information will be included on each data sheet:

- unique identifying sheet number for cross-referencing and document control;
- description or title of the inspection activity;
- location of the inspection activity or location from which the sample increment was obtained;
- type of inspection activity and procedure used (reference to standard method when appropriate);
- record of observation or test date with all necessary calculations;
- results of the inspection activity and comparison with Technical Specification requirements;
- identification of personnel involved in the inspection activity; and
- signature of the CQAI and approval by the CQAO.

6.3.2 Design Clarification Forms

A DCF is necessary when questions arise as to the design intent of the Technical Specifications and Design Drawings. DCFs should be issued in this instance, and should be directed to the Field Engineer for resolution.

6.3.3 Design Change Orders

DCOs are used to revise specific components of the remedial design. DCOs should be summarized and submitted to IEPA for approval.

6.3.4 Problem Identification and Correction Reports

A problem is defined herein as material or workmanship that does not meet the requirements of the Design Drawings or Technical Specifications. PICRs shall be cross-referenced to specific daily reports where the problem was identified. They shall be prepared in the form of a memorandum from the CQAO to IEPA, with copies to Illinois EPA's Representative, the Contractor, and other appropriate parties (e.g.,

subcontractors, subconsultants, etc.). These reports will include the following information:

- unique identifying sheet number for cross-referencing and document control;
- detailed description of the problem;
- location of the problem;
- probable cause;
- how and when the problem was located (reference to the CQAI's IDR);
- estimate of how long the problem has existed;
- suggested corrective measure;
- documentation of correction (reference to inspection data sheets);
- final results;
- suggested methods to prevent similar problems; and
- signature of the CQAO.

In some cases, all of the above information may not be available or obtainable.

6.3.5 Photographs

Photographs will be taken by Contractor QA personnel to document conditions as deemed necessary. These photographs will become a permanent part of the construction record. When photographs are taken to document a construction problem, follow-up photographs of the resolved/corrected problem should also be taken.

6.3.6 Acceptance of Completed Components

All IDRs, Inspection Data Sheets, DCOs, DCFs and PICRs will be reviewed by the CQAO.

6.3.7 Status Report

The CQAO will prepare status reports, as required, on the progress of the quality assurance program for submittal to Illinois EPA and Illinois EPA's Representative.

6.4 Record Drawings

Throughout the course of construction, a mark-up set of Design Drawings will be maintained by the CQAI to include items such as limits of excavation, all final

elevations, test and sample locations and the final building reconstruction. The Record Drawings will be revised to reflect this information.

The Record Drawings will be stamped by a licensed professional engineer and submitted to IEPA following completion of the remedial construction.

6.5 Final Documentation

At the completion of the project, a CQA certification report will be submitted to IEPA for approval. The intent of this report shall be to document that the project was constructed in conformance with the final design documents. This report will include summaries of the IDRs, Inspection Data Sheets, lab testing reports, DCOs, DCFs and PICRs.

The certification report will be prepared by Contractor QA personnel and, as a minimum, will include the following information:

- description of document control and cross-referencing system used;
- description of the work item (e.g., collection trenches, final cover system);
- quality characteristic being evaluated and references to design criteria, Design Drawings and Technical Specifications;
- sampling requirements for the inspected item;
- sample item locations (describe by project coordinates or by a location drawing);
- inspections made (procedure defined by name or other identifier and a unique identifying sheet number for inspection data sheets);
- summary of inspection results (average and, if available, the standard deviation for each quality characteristic);
- definition of acceptance criteria (comparison of inspection data with design specification requirement; compliance or noncompliance; in the event of non-compliance, identification of documentation that gives reasons for acceptance outside of the specified design); and
- signature and professional stamp of the CQAO.

Record Drawings will be submitted separately by the Engineer of Record.

6.6 Document Control

A document control scheme has been developed for the CQA documentation for Area 4. The document control scheme will allow easy access to all CQA documents and will enable a reviewer to identify and retrieve original data sheets. Separate log books will be maintained for each of the reports listed in this section.

The data control scheme for CQA procedures for the Area 4 remediation consist of the following:

- IDRs will be numbered sequentially and dated based upon the area being remediated. For example, the report for Day 1 of construction at Area 4 will be report number A4-001. The sheets will also include the date, and will include the sheet numbers for any data sheets which were used on that particular day.
- DCFs will be numbered sequentially. They will include cross-references to applicable data sheets, Technical Specifications, and/or Design Drawings.
- DCOs will be numbered sequentially. They will include cross-references to applicable data sheets, Technical Specifications, and/or Design Drawings.
- PICRs will be numbered sequentially. The reports will include cross-references to the applicable data sheets, Technical Specifications and/or Design Drawings.
- The CQA status reports will be labeled for the period covered. Reports will typically consist of a sitewide construction activity summary.